Embedded Dismounted Simulation – Providing Unit Soldier Training and Mission Rehearsal

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What is Embedded Training (ET)?

“Embedded Training (ET) is defined as a function, hosted in hardware and/or software, that is integrated into the overall equipment configuration. ET supports training, assessment, and control of exercises on the operational equipment with auxiliary equipment and data sources as necessary.”

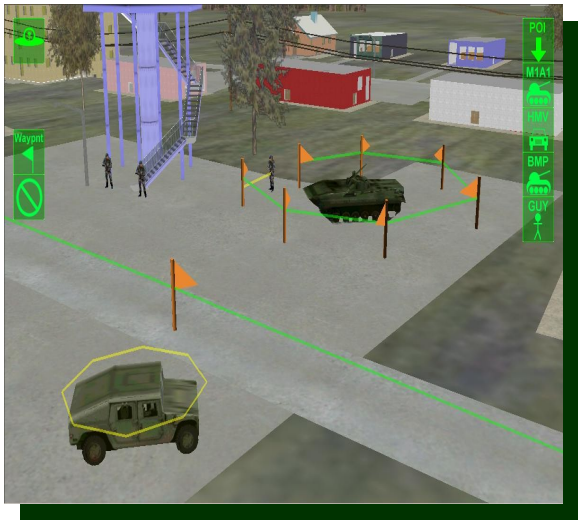
Embedded training has been selected as the user’s preferred training option for Future Combat Systems (FCS).

Mounted/Dismounted Embedded Trainin

In future military operations, the entire squad would be equipped with embedded training systems and the rehearsal would be conducted from the back of the ICV or dismounted from the vehicle.

Mounted/Dismounted Embedded Training for Today's Force

In today's Stryker vehicle, the Embedded Training Module (ETM), could be utilized to perform the Mission Planning/Setup and After Action Review Debrief activities for the crew.



Embedded Combined Arms Team Training and Mission Rehearsal Science & Technology Objectiv

Purpose:

Provide collective embedded training and on-demand mission rehearsal for current and future Unit of Action forces

Product:

Proof of Concept for field-capable interoperable mounted/dismounted embedded training

Payoff:

- **Deployable sustainment training and mission rehearsal for combined arms forces that accurately replicate contemporary operations.**
- **Ability to conduct effective training without significant external support**
- **Transition to [illegible] Training IPT, PM CATT, PM OneSAF, PEO**

A Major Simulation Technology Gap

The US Army Training and Doctrine Command (TRADOC) has identified “embedded training for mounted and dismounted interoperability” as the number one training and leader education technology gap.

This short fall is a major research focus for the RDECOM Simulation and Training Technology Center’s ECATT-MR STO. This STO demonstrated “proof of concept” for a mounted/ dismounted embedded exercise at Capital Hill during the winter [illegible].

Embedded Training for Dismounted Soldier Science & Technology Objective (STO)

Focuses on visual and augmented reality technologies for training the dismounted soldier.

Produces technologies that will aid both the Land Warrior program and the Future Force Warrior (FFW) ATD in design of their embedded training capabilities.

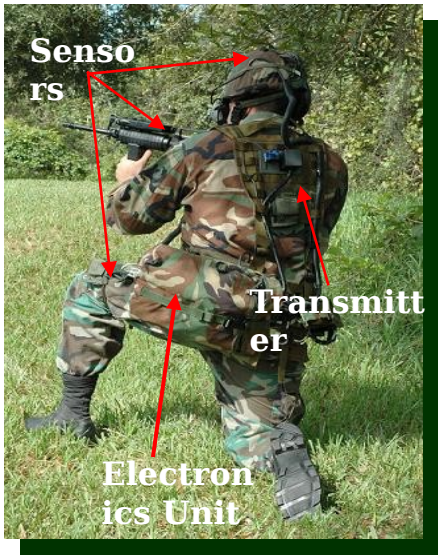
Focuses on man-wearable embedded training solutions with the objective of integration into the FFW ATD system.

Dismounted Training Technology Areas

- **HMDs - Issues include device weight, field of view, resolution, brightness, power consumption, ruggedness and cost.**

- **Wearable Computers – Need smaller, low power computers; LW computer lacks Graphics Processing Unit (GPU); Thermite-type device to meet need**

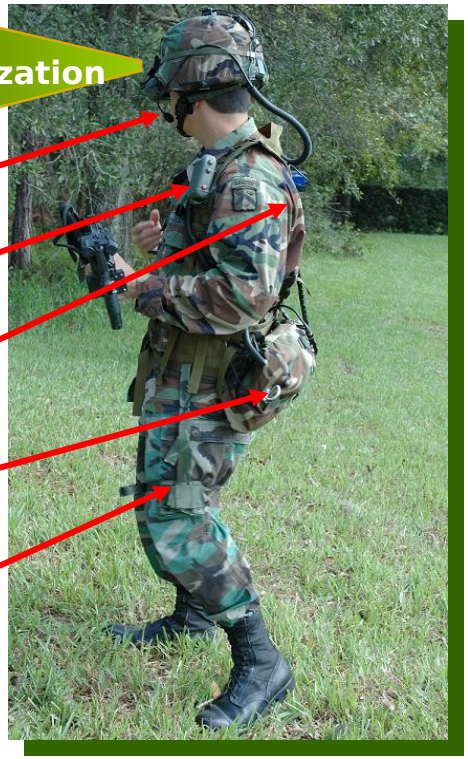
Dismounted Training Technology Needs (cont)



- **Movement Tracking Devices - Need precise tracking of weapon, soldier's head, body, arms. Developing six Degree of Freedom (6-DOF) man wearable system. Working with the OneTESS program to develop an instrumented weapon.**
- **Soldier Movement in Virtual Environment – Need alternatives to weapon-mounted buttons (e.g. pressure mat) to control soldier movement.**
- **Sensor & Communications Integration – Incl[illegible]nor feeds from robotic systems**

Dismounted Soldier Simulation (DSS) Syste

3D Visualization



Integrated Comms

LW SCU

Orientation Transmitter

Tracking Electronics

Body Sensor 6DOF - Determines orientation & stance (height) of user

Head Sensor 3DOF

Helmet Mounted Display

Weapon Sensor 6DOF

Body Worn Computer With Wireless LAN Connectivity

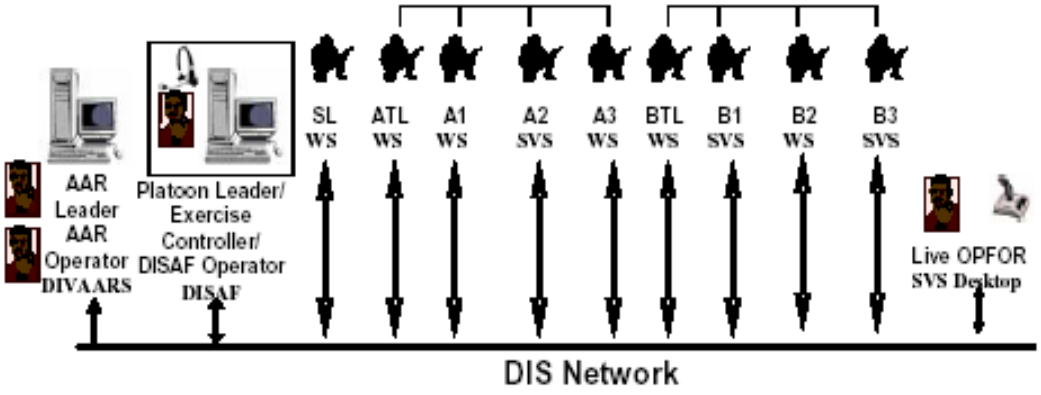
Combination of self-contained Transmitter, trackers, visualization, comms and computing allows immersion/instrumentation with total portability

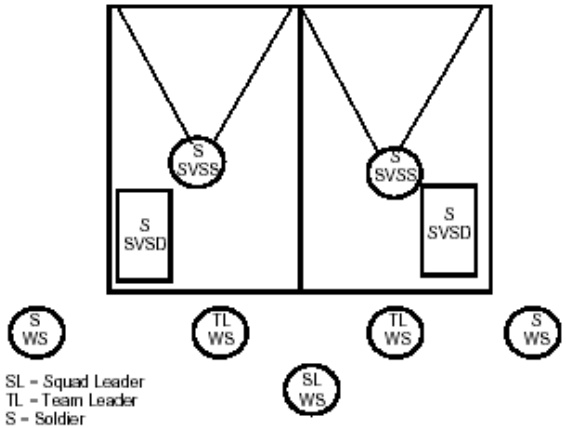
ETDS Culminating Event at Ft. Benning July 2004

Purpose:

To evaluate soldiers in a virtual MOUT site performing various tactical tasks using man-wearable systems

A variety of wearable embedded systems as well as existing soldier simulation systems were evaluated





ETDS Culminating Event Findings

- Most participants felt that the Embedded Immersive technologies had the potential to be a great mission overview, rehearsal, and training tool, saving lives.

- Overall, simulation sickness was similar between the embedded and existing simulation systems.

- However, most were concerned that the technology would not replace live training,

The Way Forward

- Following the technology assessment at Fort Benning the ETDS STO technologies merged into the ECATT-MR STO.

- Findings from the dismounted technology assessment will guide development of a man wearable system.

- The current systems will be expanded in include a limited set of JVMF messages to include realistic C4ISR training.

- Improve technology readiness levels to a Technology Readiness Level (TRL) which sufficient to transition the technologies to users such

Engineering Evaluation of Mounted/Dismounted Embedded Training Interoperability (FY06)

CAT Vehicle

Mounted/Dismounted Training Protocols,
Wireless Network Messages.
Video.
Situational Awareness,
Active Protection Danger Areas

Embedded AAR Computer Generated Forces (CGF) Mission Rehearsal System

ARV-Assault

Dismounted Mission Rehearsal For Robotic Systems

Likely Players
ECATT-MR/ETDS STO
CAT ATD
HRI STO
ART STO

Embedded Dismounted Systems

Questions?

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